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THE INFLUENCE OF POE LEARNING (PREDICT OBSERVE EXPLAIN) MODEL ON THE UNDERSTANDING OF SCIENCE CONCEPT OF STUDENTS OF SMP NEGERI 32 SEMARANG

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Abstract

This study aims to determine the influence of the POE (Predict Observe, Explain) learning model on understanding the student's science concept on the material and its application in daily life. This is due to research on using POE learning model to understand the concept has not done much. This type of research isquantitative experimentation with posttest only class experiment control design. The research method began from observation at SMP Negeri 32 Semarang, compiled a research instrument, execute learning with POE model, then analysis of research data and make conclusions. Data analysis results show that the experimental class classical submission was 77 while in the control class of 70. The results expressed the influence of POE learning models to understand the concept. The findings in this study have been the collation between the POE learning model of the understanding of the concept,learning model of the motivation to learn. The conclusion of this study was the influence of POE learning model of the conceptual understanding of 53.13% and the coleration of 43%. The advice of this research is that the use of POE-defecting models that affect students ' understanding can be used as a reference in enhancing the understanding of student concepts.

***Keywords**: Learning Model; Predict Observe Explain; Conceptual Understanding.*

Abstrak

Penelitian ini bertujuan untuk mengetahui pengaruh model pembelajaran POE (Predict-Observe-Explain) terhadap pemahaman konsep IPA siswa pada materi tekanan zat dan penerapanya dalam kehidupan sehari hari. Hal ini disebabkan penelitian tentang penggunaan model pembelajaran POE terhadap pemahaman konsep belum banyak dilakukan. Jenis penelitian ini adalah kuantitatif eksperimen dengan posstest only class experiment control design. Metode penelitian dimulai dari observasi di SMP Negeri 32 Semarang, menyusun instrumen penelitian, melaksanakan pembelajaran dengan model POE, kemudian analisis data penelitian dan mengambil kesimpulan. Hasil analisis data menunjukkan bahwa ketuntasan klasikal kelas eksperimen sebesar 77 sedangkan pada kelas kontrol 70. Hasil penelitian menyatakan adanya pengaruh model pembelajaran POE terhadap pemahaman konsep. Temuan dalam penelitian ini yaitu adanya kolerasi antara model pembelajaran POE terhadap pemahaman konsep, adanya kolerasi antara model pembelajaran POE terhadap motivasi belajar, dan adanya kolerasi antara motivasi belajar dengan pemahaman konsep siswa. Simpulan dari penelitian ini yaitu adanya pengaruh model pembelajaran POE terhadap pemahaman konsep sebesar 53,13% serta kolerasi sebesar 43%. Saran dari penelitian ini adalah penggunaan model pembelajran POE dapat mempengaruhi pemahaman siswa dan dapat digunakan sebagai referensi dalam meningkatkan pemahaman konsep siswa.

***Katakunci**: Model Pembelajaran; Predict Observe Explain; Pemahaman Konsep IPA.*

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BACKGROUND

The National Education System states that, what is meant by education is a conscious and planned effort to create an atmosphere of learning and learning process so that students actively develop their potential to have spiritual spiritual strength, self-control, personality, intelligence, noble character, and the skills needed himself, society, nation and state contained in Law Number 20 Year 2003. The learning process is a process of interaction between humans and the environment carried out in a planned manner to achieve the desired understanding, skills and attitudes.

POE learning method is a learning strategy in the order that the process of building knowledge first predicts the solution of a problem presented, conducts experiments to prove predictions, and finally explains the results of experiments that have been conducted (Suyanto et al., 2012). Learning with the POE model can support students 'understanding as other studies mention by using the POE model can improve students' reading comprehension skills seen from the improvement of the KKM.

Hudson (2010) revealed that learning strategies will determine the shape of student learning environments. The use of POE learning strategies creates a positive learning environment (innovative, flexible, and communicative) for students in learning physics. Understanding the concept or cognitive mastery of the deeper understanding domains makes it easier for students to master the more complex levels of cognitive domains because understanding concepts is a condition for cognitive mastery in the realm of apply, analyze, evaluate, and create. That is what portrays science as a process that helps students to achieve the science product itself as the goal of learning (Juniati. 2009).

The POE procedure includes the prediction of students from the results of the demonstration (predict), conducting experiments (observe), discussing the reasons for the predictions (demonstration results) they made and finally explaining the prediction results from their observations (explain). Another scientific method is to analyze and make conclusions. Understanding of concepts that can be misinterpreted in junior high school science learning that makes concepts in learning wrong. Concept understanding is the ability of students in the form of mastery of a number of subject matter (Sanjaya, 2009) with the understanding indicators used in this study include 7 indicators of concept comprehension including interpreting, modeling, classifying, summarizing, summarizing, comparing and used in questions in the form of three tier tests

Research conducted in learning with POE models and use of evaluation sheets in learning activities that will provide better understanding and value. The level of student understanding can be measured by evaluating the tests carried out by distributing test sheets to each student to be tested how much their understanding of the material has been taught. Evaluation is an activity of measuring and evaluating (Arikunto, 2006). Three-tier test is a test that is composed of three levels of questions. The first level (one tier) in the form of multiple choice, the second level (two tier) in the form of a choice of reasons, and the third level (three tier) in the form of affirmation questions about the beliefs of the answers that have been chosen at levels one and two (Kirblut and Demet, 2014).

Table 1. Competencies for Material Pressure and its Application in Daily Life based on 2013 Curriculum

Competencies		**Basic Competencies**	
3.	Understanding knowledge (factual, conceptual, and procedural) based on his curiosity about science, technology, art, culture related to phenomena and events seen in the eye	3.8	Explain the pressure of substances and their application in daily life, including osmotic blood pressure and capillary transport tissue in plants
4.	Trying, processing, and presenting in the realm of concrete (using, unraveling, composing, modifying, and making) and abstract domains (writing, reading, calculating, drawing and composing) in accordance with what is learned in school and other sources in the same perspective /theory.	4.6	Presenting experimental data to investigate the pressure of a liquid at a certain depth, buoyancy, and capillarity, for example in plant stems

METHOD

This research was conducted at SMP Negeri 32 Semarang, Jl. Ki Mangunsarkoro No.1, Karangkidul, Central Semarang, Semarang City. The research was carried out in class VIII even semester of the 2018/2019 school year. The population in this study were students of class VIII A, B, C, D and E at SMP Negeri 32 Semarang, totaling 179 students. The sampling method is based on the Cluster Random Sampling technique. Sampling by cluster (cluster random sampling) that is by taking samples from the population is done randomly without regard to strata that exist in the population (Sugiyono, 2016). This type of research used in this study is Quasi Experiment (quasi-experiment) This design has a control group, but it cannot function fully to control the external variables that affect the implementation of the experiment, where researchers are not able to control all the variables that affect the dependent variable (Sugiyono , 2017). The research design used is the

Posstest-Only Control Design. In this design there are two groups, each randomly chosen (R). The first group was given treatment (X) and the other group was not. The following is the research implementation chart.

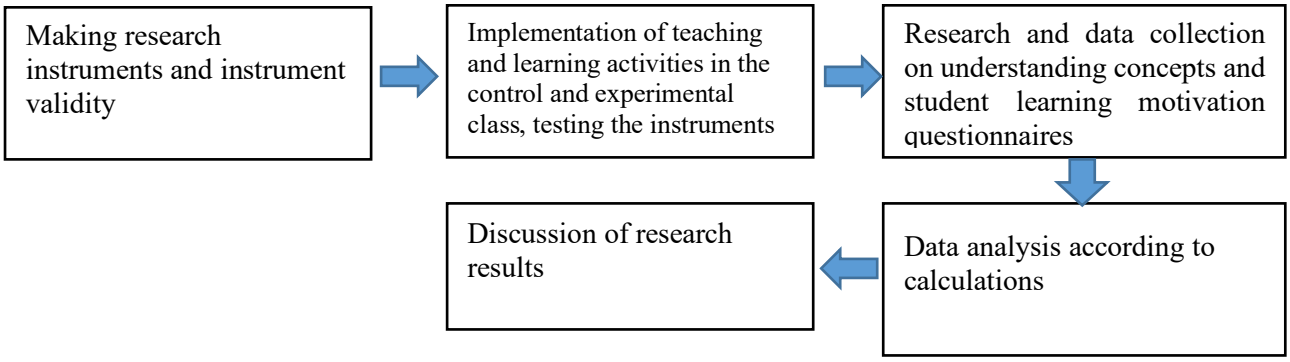

Figure 1. Stages of Research Implementation

RESULTS AND DISCUSSION

The results of the study were obtained after a study of learning about POE modeled natural science in SMP Negeri 32 Semarang data obtained in the form of the results of understanding the concept of IPA material pressure and its application in everyday life. The research that has been carried out aims to analyze the ability to understand students' concepts through the POE learning model.

The results of research that has been done is the retrieval of research data using the posttest. Posttest is used to measure the ability of understanding the concept of science in students of the POE learning model after students follow all the learning on the material pressure and its application in everyday life. This research was conducted in January to February 2019 at SMP Negeri 32 Semarang, Semarang City.

The study was conducted on the material pressure and its application in daily life in class VIII semester 2 as many as four meetings according to the RPP namely three meetings used to deliver material using the POE learning model and one meeting at the end for the posttest. Material pressure and its application in daily life in this study are divided into three sub-materials namely solid pressure, liquid pressure, and gas pressure.

Quantitati analysis of students' concept understanding ability can be known through the posttest instrument. These posttest questions amounted to 20 items given to students at the end of learning the material pressure and its application in everyday life. Analysis of students' understanding of concepts through posttest is done by calculating the posttest score on each individual. Posttest score results are then grouped based on high, medium and low criteria. Understanding of the concepts in students based on the posttest results can be seen in Table 2.

Table 2. Criteria for Understanding the Concept

Criteria	Percentage	
	Experiment Class	Control Class
Understand	53,15	39,25
Misconception	39,44	53,40
Guessing	7,736	7,35

The results of the analysis in the table show that on average 53.15% of students have a concept understanding, 39.44% of students have a misconception of the material and 7.736% of students have a guessing category. Percentage of analysis of posttest results for students' understanding of concepts by. The results obtained are based on the results of the posttest which shows the high understanding of concepts in the experimental class compared to the control class. That is because of the different learning models used. The average posttest score of the experimental class was 77 while the control class was 70 classically in each class. The posttest question used is three tier multiple choice questions. The percentage of posttest analysis results of the students' understanding of the concept of the experimental class was higher by using the POE learning model.

This study also considers each indicator of students' concept understanding ability Understanding indicators used in this study include 7 indicators of concept understanding including interpreting, modeling, classifying, summarizing, summarizing, comparing and explaining. Understanding indicators contained in the posttest questions to measure the magnitude of students' understanding of concepts in science learning, include:

1. Interpret: Indicators interpret where students can change information from one form to another, changing words into images, numbers into words and the like, so that what information obtained by students can be understood by others.
2. Take an example: Indicators that require students to find specific examples of a concept being studied, which involve identifying features of the concept to select specific examples.
3. Classifying: Indicators used by students in determining something into a particular group that completes the exemplary process. Students can know the examples that have been mentioned.
4. Summarize: Indicators understand that students are asked to summarize a material discussion by expressing a sentence that presents the information obtained.
5. Suppose: Indicators that students are required to draw a logical conclusion from a concept that explains the examples by looking at the characteristics and relationships.
6. Compare: Indicators whose students are asked to be able to detect correspondence between two ideas, objects, and the like in an event.
7. Explain: Indicators that students are able to create a causal model in a system that is studied.

The results of the analysis of mastery learning which shows that the experimental class is classically complete whereas the control class does not. Based on the bus r test and t test analyzed. In the RBIS analysis obtained of 0.66 with a tcount of 5.06 and t table of 2.03 then the value of r bis is positive then there is a direct perfect linear relationship with a moderate level of relationship. Use of models POE learning in the experimental class has a different effect with the control class. The average value of experiment and control is different. Analysis of the independent test test (t test) obtained KD of t count 5.123 which proves Ha is accepted by t arithmetic> T table. There is an influence between POE learning models on concept understanding.

Indicators of students who understand a concept according to the BNSP (2006: 59) there are seven characteristics of understanding the concept. The use of learning models in the analysis of understanding concepts that see from the answers of students to the questions given in the form of three tier tests that analyzed the understanding of concepts between the experimental and control classes are different. This difference apart from the learning model used shows the results of understanding the concepts, misconceptions and guesses made by students.

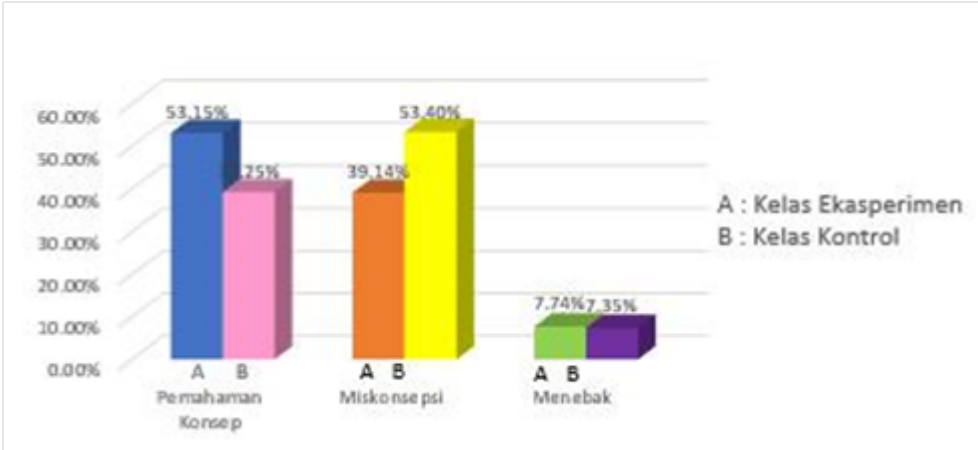

Figure 2. Comparation Students Conceptual Understanding

Judging from the analysis results above diagram shows an understanding of the concept of science in the material pressure of substances and their application in daily life in the experimental class is greater than the control class difference of 4%. Whereas for the analysis of misconceptions between the experimental and control classes, more were misconceptions in the dick class. And in the analysis of students who are categorized guessing between the experimental class and the control the same amount. Based on the results of classical completeness analysis, RBIS, and t test of science learning with POE learning models can improve learning outcomes, conceptual understanding, but less effective on student learning outcomes. It is said to be less effective because in the learning experimental class using POE learning models can improve learning outcomes but not too large. Classically the experiment class was 64% with 23 students who passed the KKM and the control class was 31% with 11 students completing the KKM. Understanding the concept between the

experimental class can be said to be high compared to the control class, seen from the percentage of understanding of the science concept in class VIII material about the pressure of the substance. Similar results were also obtained in other studies on the use of the POE model in learning that improved student learning activities and understanding related to the material being taught.

CONCLUSIONS AND RECOMMENDATIONS

A. Conclusions

1. Science learning with POE (Predict Observe Explain) model of pressure material and its application in daily life is carried out at SMP Negeri 32 Semarang, influencing the understanding of concepts as well as fulfilling classical learning completion criteria.
2. Science learning with POE model (Predict Observe Explain) material pressure and its application in daily life which is carried out at SMP Negeri 32 Semarang affects the concept understanding

B. Recommendations

1. It is expected for other researchers to develop this research by correcting the existing shortcomings of conditioning students when carrying out practicum activities properly
2. Learning preparation needs to be planned well, such as what is used in learning. In addition, teachers must also check the tools used by the practicum before use.

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